

CLAIMS

We claim:

1. A method for separating a flow of crops containing useful material and waste material into a useful material flow and a waste material flow, wherein in the useful material flow, the useful material is concentrated and in the waste material flow, the waste material is concentrated, comprising the following steps:

separating the flow of crops into a pre-cleaned flow containing a substantial portion of the useful material and a remaining portion of the waste material with a first selectivity and a first waste material flow containing a substantial portion of the waste material and a remaining part of the useful material;

separating the pre-cleaned flow with a second selectivity depending on its flow rate into the useful material flow and a second waste material flow containing a substantial portion of waste material and a remaining portion of the useful material;

detecting continuously at least one quantity of the amount of useful material flow combined into the waste material flow; and

controlling the first selectivity based on the at least one quantity independently from the flow rate of the flow of crops.

2. The method according to claim 1, wherein a quantity of the combined amount of the useful material with one of the two waste material flows is detected.

3. The method according to claim 1, wherein in the amount of useful material contained in a waste material flow is detected by measurement of the waste material flow after the separating step.

4. The method according to claim 1, wherein the amount of useful material contained in a waste material flow is detected based on a measurement of the material flow rate of the separating step, which the waste material flow provides.

5. The method according to claim 1, wherein in the second separating step, a remaining flow is separated, which is again supplied to the first separating step.

6. The method according to claim 5, wherein the amount of useful material contained in the second waste material flow is detected based on a measurement of the material flow rate of the remaining flow.

7. The method according to claim 1, wherein the first selectivity is increased when an upper limit of the useful material portion is exceeded in the second waste material flow.

8. The method according to claim 1, wherein the first selectivity is restricted when an upper limit of the useful material in the first waste material part is exceeded.

9. The method according to claim 1, wherein upper limits for both waste material flows are defined equal or unequal.

10. The method according to claim 1, wherein the flow rate of the flow of crops is reduced when it is determined that the portion of the useful material in both waste material flows exceeds a threshold value, and wherein the flow rate is increased when the portion falls below a threshold value.

11. The method according to claim 9, wherein the method is used in a driven crop machine and wherein for increasing and/or reducing the flow rate of the flow of crops, a driving speed of the crop machine is adapted.

12. The method according to claim 11, wherein the driving speed of the crop machine is controlled automatically.

13. The method according to claim 11, wherein a direction to a user of the crop machine is produced for increasing or reducing the speed of the crop machine.

14. The method according to claim 1, wherein the flow of crops comprises grain stalks, the useful material flow substantially comprises grains, and the waste material flow substantially comprises non-grain components.

15. A device for separating a flow of crops containing useful material and waste material into a useful material flow and a waste material flow, wherein in the waste material flow, the useful material is concentrated and wherein in the waste material flow, the waste material is concentrated, with a first separating stage (2, 6), in which the flow of crops is separated with a first selectivity into a pre-cleaned flow, which contains a substantial portion of the useful material and a remaining portion of the waste material, and a first waste material flow, which contains a substantial portion of the waste material and a remaining portion of the useful material, and a second separating stage (11, 12, 14, 15), in which the pre-cleaned flow is separated with a second selectivity dependent on its flow rate into the useful material flow and a second waste material flow, which contains a substantial portion of waste material and a remaining part of the useful material, wherein the device includes at least one sensor (28, 29) for detecting a combined quantity of the amount of useful material with the waste material flows and

means (23, 24, 25, 9) for controlling the first selectivity independently from the flow rate of the flow of crops.

16. The device according to claim 15, wherein the means for controlling the first selectivity includes a control unit (25), wherein the control unit is connected to the at least one sensor (28, 29) and elements of the first separating stage that can be controlled by the control unit (25).

17. The device according to claim 15, wherein the device is a drivable crop machine.

18. The device according to claim 17, wherein the control unit (25) is coupled to a drive assembly of the device, in order to reduce the speed of the device when the portion of the useful material exceeds a threshold value in both waste material flow and/or to increase the speed when the portion of the useful material falls below a threshold value.

19. The device according to claim 17, wherein the control unit (25) is coupled to a display element of the device in order to display to a user a request to reduce the speed of the device when the portion of the useful material in both waste material flows exceeds a threshold value or to increase the speed when the selectivities fall below a threshold value.

20. The device according to claim 15, wherein the first separating stage (2, 6) includes a rotor (8) covered at least over a part of its circumferential by a cage (10a).

21. The device according to claim 15, wherein the first separating stage (2, 6) includes a rotating drum with a downstream horde shaker.

22. The device according to claim 20, wherein a parameter that can be regulated is the cross section of through-openings of the cage (10a).

23. The device according to claim 20, wherein a parameter that can be regulated is the incline of a rotatable rib (9) with reference to a rotor (18) of the first separating stage (2, 6).

24. The device according to claim 15, wherein at least one of the sensors (28, 29) is associated with one of the waste material flows in order to measure a useful material portion in this flow.

25. The device according to claim 15, wherein at least one of the sensors (26, 27) is associated to one of the separating stages, in order to measure its flow rate, and wherein the control unit is oriented to detect the useful material portion in the waste material flow produced from this separating stage based on the flow rate.

26. The device according to claim 15, wherein the second separating step produces a remaining material flow, which is supplied again via a return channel (18, 19) to the first separating stage (2, 6).

27. The device according to claim 26, wherein at least one of the sensors is associated with the return channel for detecting the flow rate of the remaining material flow, and wherein the control unit is oriented to detect the useful material portion in the waste material flow produced from the second material stage (11, 12, 14, 15) based on the flow rate.